



## SEQUENCE LISTING

<110> BOEHRINGER INGELHEIM (CANADA) LTD.

<120> SELF REPLICATING RNA MOLECULE FROM  
HEPATITIS C VIRUS

<130> 13/083

<150> 10/029,907

<151> 2001-12-21

<150> 60/257,857

<151> 2000-12-22

<160> 28

<170> FastSEQ for Windows Version 4.0

<210> 1

<211> 8639

<212> DNA

<213> HCV

<220>

<221> CDS

<222> (1803) ... (8408)

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 Pro Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp  
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ggc cg <sup>g</sup> gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc Gly Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr 240 245 250 255			2567
gca aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act Ala Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr 260 265 270			2615
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Gly Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly			
465	470	475	
gcc ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt		3287	
Ala Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly			
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tgc tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca		3335	
Cys Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser			
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Thr Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala			
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Ile Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys			
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Asp Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala			
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Tyr Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val			
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Ile Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe			
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Asp Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe			
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Ser Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp			
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caa aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc															4631	
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Pro	Ala	Ile	Ala	Ser	Leu	Met	Ala	Phe	Thr	Ala	Ser	Ile	Thr	Ser	Pro	
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Val	Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Arg	Val		

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His Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp				
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Leu Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys				
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His Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro				
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Phe Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala				
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Cys Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn				
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Lys Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp	
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Phe Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro	
1475 1480 1485	
ctg tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac	6311
Leu Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His	
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Gly Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg	
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ccc atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc Pro Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val 1635 1640 1645	6743
tat gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc Tyr Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr 1650 1655 1660	6791
ttt gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag Phe Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys 1665 1670 1675	6839
gag atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg Glu Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val 1680 1685 1690 1695	6887
gag gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt Glu Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe 1700 1705 1710	6935
ggc tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac Gly Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn 1715 1720 1725	6983
cac atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca His Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro 1730 1735 1740	7031
att gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca Ile Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro 1745 1750 1755	7079
gag aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg Glu Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu 1760 1765 1770 1775	7127
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ctc cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct Leu Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro 1795 1800 1805	7223
gga cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc	7271

Gly Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys	1810	1815	1820	
cct atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act	1825	1830	1835	7319
Pro Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr				
gag aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg	1840	1845	1850	7367
Glu Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu				
gcc ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac	1860	1865	1870	7415
Ala Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr				
atc ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc	1875	1880	1885	7463
Ile Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg				
cgg tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc	1890	1895	1900	7511
Arg Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu				
aca tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag	1905	1910	1915	7559
Thr Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln				
gac tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa	1920	1925	1930	7607
Asp Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu				
agc gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag	1940	1945	1950	7655
Ser Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu				
gct atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa	1955	1960	1965	7703
Ala Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu				
tac gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg	1970	1975	1980	7751
Tyr Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala				
cac gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc	1985	1990	1995	7799
His Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr				
acc ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc	2000	2005	2010	7847
Thr Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val				
aat tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca	2020	2025	2030	7895
Asn Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala				
agg atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa	2040	2045	2050	7943
Arg Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu				

2035	2040	2045	
caa ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc			7991
Gln Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser			.
2050	2055	2060	
att gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt			8039
Ile Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu			.
2065	2070	2075	
agc gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg			8087
Ser Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val			.
2080	2085	2090	2095
gct tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga			8135
Ala Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg			.
2100	2105	2110	
cat cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg			8183
His Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg			.
2115	2120	2125	
gct gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag			8231
Ala Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys			.
2130	2135	2140	
ctc aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc			8279
Leu Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser			.
2145	2150	2155	
tgg ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct			8327
Trp Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser			.
2160	2165	2170	2175
cgt gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta			8375
Arg Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val			.
2180	2185	2190	
ggg gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca			8428
Gly Val Gly Ile Tyr Leu Leu Pro Asn Arg *			.
2195	2200		
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<221> variation

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<221> variation  
<222> 4446  
<223> r = a or g

<400> 2

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ccccctccc gggagagcca tagtggctcg cggaaccgt gactacaccg gaattgcccag 180  
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cgccgcttg ggtggagagg ctattcggt atgactggc acaacagaca atcggtctg 480  
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Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly  
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ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897  
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg  
20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945  
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35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993  
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val  
50 55 60

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65 70 75 80

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Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly				
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca	100	105	110	2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala				
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct	115	120	125	2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala				
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc	130	135	140	2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu				
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg	145	150	155	2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val				
gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc	165	170	175	2329
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr				
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	180	185	190	2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro				
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	195	200	205	2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser				
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	210	215	220	2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser				
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc	225	230	235	2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly				
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	245	250	255	2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala				
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	260	265	270	2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val				
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	275	280	285	2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile				
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	290	295	300	2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala				

ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320 .	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cg <sup>g</sup> cg <sup>g</sup> Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac agc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
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gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro 420 425 430	3097
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gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly 450 455 460	3193
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ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys 485 490 495	3289
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr 500 505 510	3337
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acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga	3433

Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly			
530	535	540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc			3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser			
545	550	555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc			3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile			
565	570	575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgt gat			3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga aat gct gta gca tat			3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
595	600	605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att			3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
610	615	620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac			3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc			3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser			
645	650	655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg			3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Thr Val Pro Gln Asp Ala			
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gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc			3865
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
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Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp			
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Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu			
705	710	715	720
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca			4009
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr			
725	730	735	
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc			4057
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val			
740	745	750	
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag			4105
Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys			

755

760

765

cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780	4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800	4201
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Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly	
1010 1015 1020	
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Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val	
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Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala	
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Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn	
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Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val	
1075 1080 1085	
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Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val	
1090 1095 1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cggt aac cac gtc	5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val	
1105 1110 1115 1120	
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act	5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr	
1125 1130 1135	
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His	
1140 1145 1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta	5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu	
1155 1160 1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc	5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr	
1170 1175 1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc	5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe	
1185 1190 1195 1200	
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg	5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met	
1205 1210 1215	

caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
tgt tcc atg agg atc gtg ggg cct agg acc tgt aac acg tgg cat Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg cggt gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cgg ttg cac agg tac gct cca gcg tgc Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys 1315 1320 1325	5785
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln 1330 1335 1340	5833
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala 1345 1350 1355 1360	5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr 1365 1370 1375	5929
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380 1385 1390	5977
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395 1400 1405	6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410 1415 1420	6073
cggt cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425 1430 1435 1440	6121
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag	6169

Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu			
1445	1450	1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg cg agg tcc agg aaa ttc			6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe			
1460	1465	1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg			6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu			
1475	1480	1485	
ttr gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg			6313
Xaa Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly			
1490	1495	1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca ccg agg			6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg			
1505	1510	1515	1520
aag agg acg gtt qtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg			6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala			
1525	1530	1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac			6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp			
1540	1545	1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac			6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp			
1555	1560	1565	
gcg gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag ggg			6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly			
1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc			6601
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser			
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gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg			6649
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			
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aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc			6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			
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atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat			6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			
1635	1640	1645	
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt			6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			
1650	1655	1660	
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag			6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			

1665	1670	1675	1680	
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag				6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu				
1685	1690	1695		
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc				6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly				
1700	1705	1710		
tat ggg gca aag gac gtc cg <sup>g</sup> aac cta tcc agc aag gcc gtt aac cac				6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His				
1715	1720	1725		
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att				7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile				
1730	1735	1740		
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag				7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu				
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aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg				7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly				
1765	1770	1775		
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc				7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu				
1780	1785	1790		
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga				7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly				
1795	1800	1805		
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct				7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro				
1810	1815	1820		
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag				7321
Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu				
1825	1830	1835	1840	
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc				7369
Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala				
1845	1850	1855		
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc				7417
Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile				
1860	1865	1870		
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg				7465
Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg				
1875	1880	1885		
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca				7513
Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr				
1890	1895	1900		

tgt tac ttg aag gcc gct ggc tgt cga gct ggc aag ctc cag gac	7561
Cys Tyr Leu Lys Ala Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp	
1905 1910 1915 1920	
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc	7609
Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser	
1925 1930 1935	
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct	7657
Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala	
1940 1945 1950	
atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac	7705
Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr	
1955 1960 1965	
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac	7753
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His	
1970 1975 1980	
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc	7801
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr	
1985 1990 1995 2000	
ccc ctt gcg cgg gct gcg tgg gag aca gct aga cac act cca gtc aat	7849
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn	
2005 2010 2015	
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg	7897
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg	
2020 2025 2030	
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa	7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln	
2035 2040 2045	
ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att	7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile	
2050 2055 2060	
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc	8041
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser	
2065 2070 2075 2080	
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct	8089
Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala	
2085 2090 2095	
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat	8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His	
2100 2105 2110	
cgg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct	8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala	
2115 2120 2125	

gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc 8233  
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu  
2130 2135 2140

aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg 8281  
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp  
2145 2150 2155 2160

ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt 8329  
Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg  
2165 2170 2175

gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg 8377  
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly  
2180 2185 2190

gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca 8427  
Val Gly Ile Tyr Leu Leu Pro Asn Arg \*  
2195 2200

ggccaatagg ccatcctgtt tttttccctt tttttttttt tttttttttc tttttttttt 8487  
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<213> HCV

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<223> Xaa is Lys or Arg

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<223> Xaa is Leu

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Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu  
35 40 45  
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val  
50 55 60  
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr  
65 70 75 80  
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly  
85 90 95  
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala  
100 105 110  
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala  
115 120 125  
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu

130	135	140	
Thr Pro Leu Arg Asp Trp Ala His Ala Gly	Leu Arg Asp Leu Ala Val		
145	150	155	
Ala Val Glu Pro Val Val Phe Ser Asp Met	Glu Thr Lys Val Ile Thr	160	
165	170	175	
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp	Ile Ile Leu Gly Leu Pro		
180	185	190	
Val Ser Ala Arg Arg Gly Arg Glu Ile His	Leu Gly Pro Ala Asp Ser		
195	200	205	
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala	Pro Ile Thr Ala Tyr Ser		
210	215	220	
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile	Ile Thr Ser Leu Thr Gly		
225	230	235	240
Arg Asp Arg Asn Gln Val Glu Gly Glu Val	Gln Val Val Ser Thr Ala		
245	250	255	
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn	Gly Val Cys Trp Thr Val		
260	265	270	
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala	Gly Pro Lys Gly Pro Ile		
275	280	285	
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp	Leu Val Gly Trp Gln Ala		
290	295	300	
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys	Thr Cys Gly Ser Ser Asp		
305	310	315	320
Leu Tyr Leu Val Thr Arg His Ala Asp Val	Ile Pro Val Arg Arg Arg		
325	330	335	
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro	Arg Pro Val Ser Tyr Leu		
340	345	350	
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys	Pro Ser Gly His Ala Val		
355	360	365	
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg	Gly Val Ala Lys Ala Val		
370	375	380	
Asp Phe Val Pro Val Glu Ser Met Glu Thr	Thr Met Arg Ser Pro Val		
385	390	395	400
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val	Pro Gln Thr Phe Gln Val		
405	410	415	
Ala His Leu His Ala Pro Thr Gly Ser Gly	Lys Ser Thr Lys Val Pro		
420	425	430	
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val	Leu Val Leu Asn Pro Ser		
435	440	445	
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr	Met Ser Lys Ala His Gly		
450	455	460	
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg	Thr Ile Thr Thr Gly Ala		
465	470	475	480
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe	Leu Ala Asp Gly Gly Cys		
485	490	495	
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp	Glu Cys His Ser Thr		
500	505	510	
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr	Val Leu Asp Gln Ala Glu		
515	520	525	
Thr Ala Gly Ala Arg Leu Val Val Leu Ala	Thr Ala Thr Pro Pro Gly		
530	535	540	
Ser Val Thr Val Pro His Pro Asn Ile Glu	Glu Val Ala Leu Ser Ser		
545	550	555	560
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala	Ile Pro Ile Glu Thr Ile		
565	570	575	
Lys Gly Gly Arg His Leu Ile Phe Cys His	Ser Lys Lys Cys Asp		
580	585	590	

Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr  
595 600 605  
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile  
610 615 620  
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp  
625 630 635 640  
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser  
645 650 655  
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala  
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Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly  
675 680 685  
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp  
690 695 700  
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu  
705 710 715 720  
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr  
725 730 735  
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val  
740 745 750  
Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys  
755 760 765  
Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val  
770 775 780  
Cys Ala Arg Ala Gln Ala Pro Pro Pro Ser Trp Asp Gln Met Trp Lys  
785 790 795 800  
Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu  
805 810 815  
Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr Thr His Pro Ile  
820 825 830  
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr  
835 840 845  
Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr  
850 855 860  
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser  
865 870 875 880  
Gly Xaa Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe  
885 890 895  
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly  
900 905 910  
Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln  
915 920 925  
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys  
930 935 940  
Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile  
945 950 955 960  
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro  
965 970 975  
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu  
980 985 990  
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala  
995 1000 1005  
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly  
1010 1015 1020  
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val  
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Asp Ile Leu Ala Gly Tyr Ala Gly Val Ala Gly Ala Leu Val Ala

	1045	1050	1055												
Phe	Lys	Val	Met	Ser	Gly	Glu	Met	Pro	Ser	Thr	Glu	Asp	Leu	Val	Asn
			1060				1065						1070		
Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val
			1075				1080						1085		
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val
			1090				1095					1100			
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val
		1105			1110				1115				1120		
Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr
			1125				1130						1135		
Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His
			1140				1145					1150			
Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu
			1155				1160					1165			
Arg	Asp	Val	Trp	Asp	Trp	Ile	Cys	Thr	Val	Leu	Thr	Asp	Phe	Lys	Thr
		1170				1175						1180			
Trp	Leu	Gln	Ser	Lys	Leu	Leu	Pro	Arg	Leu	Pro	Gly	Val	Pro	Phe	Phe
		1185			1190			1195					1200		
Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	Met
			1205				1210					1215			
Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn
			1220				1225					1230			
Cys	Ser	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Ser	Asn	Thr	Trp	His
			1235				1240					1245			
Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Thr	Gly	Pro	Cys	Thr	Pro	Ser
		1250			1255			1260							
Pro	Ala	Pro	Asn	Tyr	Ser	Arg	Ala	Leu	Trp	Arg	Val	Ala	Ala	Glu	Glu
		1265			1270			1275					1280		
Tyr	Val	Glu	Val	Thr	Arg	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	Met
			1285				1290					1295			
Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe
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Phe	Thr	Glu	Val	Asp	Gly	Val	Arg	Leu	His	Arg	Tyr	Ala	Pro	Ala	Cys
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Lys	Pro	Leu	Leu	Arg	Glu	Glu	Val	Thr	Phe	Leu	Val	Gly	Leu	Asn	Gln
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Tyr	Leu	Val	Gly	Ser	Gln	Leu	Pro	Cys	Glu	Pro	Glu	Pro	Asp	Val	Ala
		1345			1350			1355					1360		
Val	Leu	Thr	Ser	Met	Leu	Thr	Asp	Pro	Ser	His	Ile	Thr	Ala	Glu	Thr
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Ala	Lys	Arg	Arg	Leu	Ala	Arg	Gly	Ser	Pro	Pro	Ser	Leu	Ala	Ser	Ser
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Ser	Ala	Ser	Gln	Leu	Ser	Ala	Pro	Ser	Leu	Lys	Ala	Thr	Cys	Thr	Thr
			1395				1400					1405			
Arg	His	Asp	Ser	Pro	Asp	Ala	Asp	Leu	Ile	Glu	Ala	Asn	Leu	Leu	Trp
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Arg	Gln	Glu	Met	Gly	Gly	Asn	Ile	Thr	Arg	Val	Glu	Ser	Glu	Asn	Lys
		1425			1430			1435					1440		
Val	Val	Ile	Leu	Asp	Ser	Phe	Glu	Pro	Leu	Gln	Ala	Glu	Glu	Asp	Glu
			1445				1450					1455			
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			1460				1465					1470			
Pro	Arg	Ala	Met	Pro	Ile	Trp	Ala	Arg	Pro	Asp	Tyr	Asn	Pro	Pro	Leu
			1475				1480					1485			
Xaa	Glu	Ser	Trp	Lys	Asp	Pro	Asp	Tyr	Val	Pro	Pro	Val	Val	His	Gly
			1490				1495					1500			

Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Pro Pro Arg Arg  
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 Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala  
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 Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu  
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 Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala  
 1845 1850 1855  
 Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile  
 1860 1865 1870  
 Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg  
 1875 1880 1885  
 Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr  
 1890 1895 1900  
 Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp  
 1905 1910 1915 1920  
 Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser  
 1925 1930 1935  
 Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala  
 1940 1945 1950  
 Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr

1955	1960	1965
Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His		
1970	1975	1980
Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr		
1985	1990	1995
Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn		
2005	2010	2015
Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg		
2020	2025	2030
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln		
2035	2040	2045
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile		
2050	2055	2060
Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser		
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Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala		
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Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His		
2100	2105	2110
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala		
2115	2120	2125
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu		
2130	2135	2140
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp		
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg		
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Val Gly Ile Tyr Leu Leu Pro Asn Arg		
2195	2200	

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 gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtaact gcctgatagg 300  
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 Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly  
 1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897  
 Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg  
 20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945  
 Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu  
 35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993  
 Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val  
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 Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly  
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ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca 2137  
 Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala  
 100 105 110

tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct 2185  
 Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala  
 115 120 125

ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc 2233  
 Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu  
 130 135 140

acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg 2281  
 Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val  
 145 150 155 160

gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc 2329

Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr			
165	170	175	
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	2377		
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro			
180	185	190	
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425		
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser			
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ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	2473		
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser			
210	215	220	
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc	2521		
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly			
225	230	235	240
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	2569		
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala			
245	250	255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617		
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val			
260	265	270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665		
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile			
275	280	285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713		
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala			
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ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	2761		
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp			
305	310	315	320
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cg <sup>g</sup> cg <sup>g</sup>	2809		
Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg			
325	330	335	
ggc gac agc agg ggg agc cta ctc tcc ccc cg <sup>g</sup> ccc gtc tcc tac ttg	2857		
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu			
340	345	350	
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	2905		
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val			
355	360	365	
ggc atc ttt cg <sup>g</sup> gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg	2953		
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val			
370	375	380	
gac ttt gta ccc gtc gag tct atg gaa acc act atg cg <sup>g</sup> tcc ccg gtc	3001		
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val			

385	390	395	400	
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405 410 415				
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420 425 430				
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435 440 445				
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450 455 460				
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465 470 475 480				
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485 490 495				
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500 505 510				
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515 520 525				
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530 535 540				
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545 550 555 560				
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565 570 575				
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580 585 590				
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595 600 605				
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610 615 620				

gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac	625	630	635	640	3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp					
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc	645	650	655		3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser					
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg	660	665	670		3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala					
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc	675	680	685		3865
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly					
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat	690	695	700		3913
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp					
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag	705	710	715	720	3961
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu					
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca	725	730	735		4009
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr					
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc	740	745	750		4057
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val					
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag	755	760	765		4105
Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys					
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg	770	775	780		4153
Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val					
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag	785	790	795	800	4201
Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys					
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg	805	810	815		4249
Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu					
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata	820	825	830		4297
Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile					
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg	835	840	845		4345
Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr					

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Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr			
850	855	860	
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc		4441	
Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser			
865	870	875	880
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc		4489	
Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe			
885	890	895	
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga		4537	
Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly			
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915	920	925	
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag		4633	
Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys			
930	935	940	
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agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc		4729	
Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro			
965	970	975	
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc		4777	
Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
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acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc		4825	
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
gcc caa ctt gct cct ccc agc gct gct tcc gta ggc gcc ggc		4873	
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
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Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc		4969	
Asp Ile Leu Ala Gly Tyr Ala Gly Val Ala Gly Ala Leu Val Ala			
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ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac		5017	
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg		5065	

Leu	Leu	Pro	Ala	Ile	Leu	Ser	Pro	Gly	Ala	Leu	Val	Val	Gly	Val	Val		
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tgc	gca	gcg	ata	ctg	cgt	cgg	cac	gtg	ggc	cca	ggg	gag	ggg	gct	gtg	5113	
Cys	Ala	Ala	Ile	Leu	Arg	Arg	His	Val	Gly	Pro	Gly	Glu	Gly	Ala	Val		
1090							1095					1100					
cag	tgg	atg	aac	cg	ctg	ata	g	tcg	t	tcg	gg	aat	ac	ac	gtc	5161	
Gln	Trp	Met	Asn	Arg	Leu	Ile	Ala	Phe	Ala	Ser	Arg	Gly	Asn	His	Val		
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Ser	Pro	Thr	His	Tyr	Val	Pro	Glu	Ser	Asp	Ala	Ala	Ala	Arg	Val	Thr		
1125							1130					1135					
cag	atc	ctc	tct	agt	ctt	acc	atc	act	cag	ctg	ctg	aag	agg	ctt	cac	5257	
Gln	Ile	Leu	Ser	Ser	Leu	Thr	Ile	Thr	Gln	Leu	Leu	Lys	Arg	Leu	His		
1140							1145					1150					
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Gln	Trp	Ile	Asn	Glu	Asp	Cys	Ser	Thr	Pro	Cys	Ser	Gly	Ser	Trp	Leu		
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Arg	Asp	Val	Trp	Asp	Trp	Ile	Cys	Thr	Val	Leu	Thr	Asp	Phe	Lys	Ala		
1170							1175					1180					
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Trp	Leu	Gln	Ser	Lys	Leu	Leu	Pro	Arg	Leu	Pro	Gly	Val	Pro	Phe	Phe		
1185							1190					1195			1200		
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Ser	Cys	Gln	Arg	Gly	Tyr	Lys	Gly	Val	Trp	Arg	Gly	Asp	Gly	Ile	Met		
1205							1210					1215					
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Gln	Thr	Thr	Cys	Pro	Cys	Gly	Ala	Gln	Ile	Thr	Gly	His	Val	Lys	Asn		
1220							1225					1230					
tgt	tcc	atg	agg	atc	gtg	ggg	cct	agg	acc	tgt	agt	aac	acg	tgg	cat	5545	
Cys	Ser	Met	Arg	Ile	Val	Gly	Pro	Arg	Thr	Cys	Ser	Asn	Thr	Trp	His		
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Gly	Thr	Phe	Pro	Ile	Asn	Ala	Tyr	Thr	Gly	Pro	Cys	Thr	Pro	Ser			
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ccg	g	cg	cc	aat	tat	tct	agg	g	cg	ctg	tgg	cg	gt	g	g	5641	
Pro	Ala	Pro	Asn	Tyr	Ser	Arg	Ala	Leu	Trp	Arg	Val	Ala	Ala	Glu	Glu		
1265							1270					1275			1280		
tac	gt	g	ag	ac	cg	gt	gg	gat	tt	ca	tc	gt	ac	gg	at	5689	
Tyr	Val	Glu	Val	Thr	Arg	Val	Gly	Asp	Phe	His	Tyr	Val	Thr	Gly	Met		
1285							1290					1295					
acc	act	gac	aac	gta	aag	tgc	ccg	tgt	cag	gtt	ccg	gcc	ccc	gaa	ttc	5737	
Thr	Thr	Asp	Asn	Val	Lys	Cys	Pro	Cys	Gln	Val	Pro	Ala	Pro	Glu	Phe		

1300	1305	1310			
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aaa ccc ctc cta cgg gag gag gtc aca ttc ctggcggctcaatcaa Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln	1330	1335	1340	5833	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala	1345	1350	1355	1360	5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr	1365	1370	1375	5929	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttggccagctca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser	1380	1385	1390	5977	
tca gct agc cag ctg tct gcgccttccatggaa gca acatgcactacc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr	1395	1400	1405	6025	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctgtgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp	1410	1415	1420	6073	
cgcgagatggcggaaacatcacccgctgtgagtcgaaatagg Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys	1425	1430	1435	1440	6121
gtatgttgcacccgttccatggccggaggatggatgg Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu	1445	1450	1455	6169	
agg gaa gta tcc gtt ccg gcggatcctgtcgagg tccaggaaa ttc Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe	1460	1465	1470	6217	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu	1475	1480	1485	6265	
tttgagttccatggaaaggacccgttccatggccgtatcacgg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly	1490	1495	1500	6313	
tgtccatgttccatggccaaaggccctccgataccatccatccatccatccagg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg	1505	1510	1515	1520	6361
aaggaggacgttgcctgttccatggccgttccatggccgtatcacgg Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala	1525	1530	1535	6409	

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Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp		
1540	1545	1550
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac		6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp		
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gcg gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag ggg		6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly		
1570	1575	1580
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc		6601
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser		
1585	1590	1595
1600		
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Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp		
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acg ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc		6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro		
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atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat		6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr		
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gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt		6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe		
1650	1655	1660
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag		6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu		
1665	1670	1675
1680		
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag		6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu		
1685	1690	1695
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc		6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly		
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tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac		6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His		
1715	1720	1725
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att		7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile		
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gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag		7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu		
1745	1750	1755
1760		

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gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu 1780 1785 1790	7177
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly 1795 1800 1805	7225
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atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu 1825 1830 1835 1840	7321
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ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile 1860 1865 1870	7417
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tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr 1890 1895 1900	7513
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp 1905 1910 1915 1920	7561
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Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr				
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Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn				
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Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg				
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atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa				7945
Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln				
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ctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att				7993
Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile				
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Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser				
2065		2070		2075
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Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala				
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tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat				8137
Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His				
2100		2105		2110
cg gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct				8185
Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala				
2115		2120		2125
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc				8233
Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu				
2130		2135		2140
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg				8281
Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp				
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg				
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gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg				8377
Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly				
2180		2185		2190
gta ggc atc tat cta ctc ccc aac cga tga acggggagct aaacactcca				8427
Val Gly Ile Tyr Leu Leu Pro Asn Arg *				
2195		2200		
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gacgaccggg tccttcttg gatcaacccg ctcaatgcct ggagatttgg gcgtgcccc 240  
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55

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 Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser  
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Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala	
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Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg	
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Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val	
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Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val	
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Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val	
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Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val	
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Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro	
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Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly	
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Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala	
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Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
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Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
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Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
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Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640
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Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
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Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp			
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Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu			
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ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca	4009		
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr			
725	730	735	
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gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly 1010	1015	1020	4873
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1040			
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1060	1065	1070	5017
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Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
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1105	1110	1115	5161
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1120	1125	1130	5209
1135			
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tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe			
1185	1190	1195	5401
1200			

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Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			
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Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			
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Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
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Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
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Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala			
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Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile			
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 c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849  
 Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly  
 1 5 10 15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897  
 Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg  
 20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945  
 Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu  
 35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993  
 Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val  
 50 55 60

atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc 2041  
 Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr  
 65 70 75 80

aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt 2089  
 Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly  
 85 90 95

ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca 2137  
 Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala  
 100 105 110

tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct 2185  
 Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala  
 115 120 125

ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc 2233  
 Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu  
 130 135 140

acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg 2281  
 Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val  
 145 150 155 160

gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc 2329  
 Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr  
 165 170 175

tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro 180 185 190	2377
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser 195 200 205	2425
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser 210 215 220	2473
caa cag acg cga ggc cta ctt ggc tgc atc atc act agc ctc aca ggc Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly 225 230 235 240	2521
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala 245 250 255	2569
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val 260 265 270	2617
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile 275 280 285	2665
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala 290 295 300	2713
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp 305 310 315 320	2761
ctt tac ttg gtc acg agg cat gcc gat gtc att ccg gtg cgc cgg cgg Leu Tyr Leu Val Thr Arg His Ala Asp Val Ile Pro Val Arg Arg Arg 325 330 335	2809
ggc gac ggc agg ggg agc cta ctc tcc ccc agg ccc gtc tcc tac ttg Gly Asp Gly Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu 340 345 350	2857
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val 355 360 365	2905
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val 370 375 380	2953
gac ttt gta ccc gtc gag tct atg gga acc act atg cgg tcc ccg gtc Asp Phe Val Pro Val Glu Ser Met Gly Thr Thr Met Arg Ser Pro Val 385 390 395 400	3001
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049

Phe	Thr	Asp	Asn	Ser	Ser	Pro	Pro	Ala	Val	Pro	Gln	Thr	Phe	Gln	Val	
405						410						415				
gcc	cat	cta	cac	gcc	cct	act	ggt	agc	ggc	aag	agc	act	aag	gtg	ccg	3097
Ala	His	Leu	His	Ala	Pro	Thr	Gly	Ser	Gly	Lys	Ser	Thr	Lys	Val	Pro	
420						425						430				
gct	gcg	tat	gca	gcc	caa	ggg	tat	aag	gtg	ctt	gtc	ctg	aac	ccg	tcc	3145
Ala	Ala	Tyr	Ala	Ala	Gln	Gly	Tyr	Lys	Val	Leu	Val	Leu	Asn	Pro	Ser	
435						440						445				
gtc	gcc	gcc	acc	cta	ggt	ttc	ggg	gct	tat	atg	tct	aag	gca	cat	ggt	3193
Val	Ala	Ala	Thr	Leu	Gly	Phe	Gly	Ala	Tyr	Met	Ser	Lys	Ala	His	Gly	
450						455						460				
atc	gac	cct	aac	atc	aga	acc	ggg	gta	agg	acc	atc	acc	acg	ggt	gcc	3241
Ile	Asp	Pro	Asn	Ile	Arg	Thr	Gly	Val	Arg	Thr	Ile	Thr	Thr	Gly	Ala	
465						470						475			480	
ccc	atc	acg	tac	tcc	acc	tat	ggc	aag	ttt	ctt	gcc	gac	ggt	ggt	tgc	3289
Pro	Ile	Thr	Tyr	Ser	Thr	Tyr	Gly	Lys	Phe	Leu	Ala	Asp	Gly	Gly	Cys	
485						490						495				
tct	ggg	ggc	gcc	tat	gac	atc	ata	ata	tgt	gat	gag	tgc	cac	tca	act	3337
Ser	Gly	Gly	Ala	Tyr	Asp	Ile	Ile	Cys	Asp	Glu	Cys	His	Ser	Thr		
500						505						510				
gac	tcg	acc	act	atc	ctg	ggc	atc	ggc	aca	gtc	ctg	gac	caa	gct	gag	3385
Asp	Ser	Thr	Thr	Ile	Leu	Gly	Ile	Gly	Thr	Val	Leu	Asp	Gln	Ala	Glu	
515						520						525				
acg	gct	gga	gct	cga	ctc	gtc	gtg	ctc	gcc	acc	gct	acg	cct	ccg	gga	3433
Thr	Ala	Gly	Ala	Arg	Leu	Val	Val	Leu	Ala	Thr	Ala	Thr	Pro	Pro	Gly	
530						535						540				
tcg	gtc	acc	gtg	cca	cat	cca	aac	atc	gag	gag	gtg	gct	ctg	tcc	agc	3481
Ser	Val	Thr	Val	Pro	His	Pro	Asn	Ile	Glu	Glu	Val	Ala	Leu	Ser	Ser	
545						550						555			560	
act	gga	gaa	atc	ccc	ttt	tat	ggc	aaa	gcc	atc	ccc	atc	gag	acc	atc	3529
Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile	Pro	Ile	Glu	Thr	Ile	
565						570						575				
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgt	gat	3577
Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	
580						585						590				
gag	ctc	gcc	gct	aag	ctg	tcc	ggc	ctc	gga	ctc	aat	gct	gta	gca	tat	3625
Glu	Leu	Ala	Ala	Lys	Leu	Ser	Gly	Leu	Gly	Leu	Asn	Ala	Val	Ala	Tyr	
595						600						605				
tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673
Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile	
610						615						620				
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721
Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	

625	630	635	640	
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser 645 650 655				3769
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala 660 665 670				3817
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly 675 680 685				3865
att tac agg ttt gtg act cca gga gaa cgg ccc tcg ggc atg ttc gat Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp 690 695 700				3913
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720				3961
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735				4009
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag agc gtc Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Ser Val 740 745 750				4057
ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765				4105
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780				4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800				4201
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815				4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820 825 830				4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845				4345
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860				4393

tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865 870 875 880	4441
gga aag ccg gcc atc att ccc gac agg gaa gtc ttt tac cgg gag ttc Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Phe Tyr Arg Glu Phe 885 890 895	4489
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900 905 910	4537
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln 915 920 925	4585
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys 930 935 940	4633
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile 945 950 955 960	4681
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro 965 970 975	4729
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu 980 985 990	4777
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala 995 1000 1005	4825
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly 1010 1015 1020	4873
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val 1025 1030 1035 1040	4921
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala 1045 1050 1055	4969
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn 1060 1065 1070	5017
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val 1075 1080 1085	5065

tgc gca gcg ata ctg cgt cg <sup>g</sup> cac gtg ggc cca ggg gag ggg gct gtg Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val 1090 1095 1100	5113
cag tgg atg aac cg <sup>g</sup> ctg ata gc <sup>g</sup> ttc gct tcg cg <sup>g</sup> ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cg <sup>t</sup> gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag acc Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Thr 1170 1175 1180	5353
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
tca tgt caa cgt ggg tac aag gga gtc tgg cg <sup>g</sup> ggc gac ggc atc atg Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met 1205 1210 1215	5449
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
cgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Arg Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545
gga aca ttc ccc att aac gc <sup>g</sup> tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser 1250 1255 1260	5593
ccg gc <sup>g</sup> cca aat tat tct agg gc <sup>g</sup> ctg tgg cg <sup>g</sup> gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cg <sup>g</sup> gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc cg <sup>g</sup> tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
ttc aca gaa gtg gat ggg gtg cg <sup>g</sup> ttg cac agg tac gct cca gc <sup>g</sup> tgc	5785

Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys			
1315	1320	1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa			5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln			
1330	1335	1340	
tac ctg gtt ggg tca cag ctc cca tgc gag ccc gaa ccg gac gta gca			5881
Tyr Leu Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Pro Asp Val Ala			
1345	1350	1355	1360
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg			5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr			
1365	1370	1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca			5977
Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser			
1380	1385	1390	
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc			6025
Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr			
1395	1400	1405	
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg			6073
Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp			
1410	1415	1420	
cg <sup>g</sup> cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag			6121
Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys			
1425	1430	1435	1440
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag			6169
Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu			
1445	1450	1455	
agg gaa gta tcc gtt ccg gcg gag atc ctg ccg agg tcc agg aaa ttc			6217
Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe			
1460	1465	1470	
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg			6265
Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu			
1475	1480	1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg			6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly			
1490	1495	1500	
tgt cca ctg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg			6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Arg Arg			
1505	1510	1515	1520
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg			6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala			
1525	1530	1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac			6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp			

1540	1545	1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac			6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp			
1555	1560	1565	
gcg gga tcc gac gtt gag tcg tac tcc tcc atg ccc ccc ctt gag ggg			6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly			
1570	1575	1580	
gag ccg ggg gat ccc gat ctc agc gac ggg cct tgg tct acc gta agc			6601
Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Pro Trp Ser Thr Val Ser			
1585	1590	1595	1600
gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg			6649
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			
1605	1610	1615	
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc			6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			
1620	1625	1630	
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat			6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			
1635	1640	1645	
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt			6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			
1650	1655	1660	
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag			6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			
1665	1670	1675	1680
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag			6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu			
1685	1690	1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc			6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			
1700	1705	1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac			6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His			
1715	1720	1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att			7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile			
1730	1735	1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag			7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu			
1745	1750	1755	1760
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg			7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly			
1765	1770	1775	

gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu 1780 1785 1790	7177
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly 1795 1800 1805	7225
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro 1810 1815 1820	7273
atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu 1825 1830 1835 1840	7321
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala 1845 1850 1855	7369
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile 1860 1865 1870	7417
ggg ggc ccc ctg act aat tct aaa ggg cag aac tgc ggc tat cgc cgg Gly Gly Pro Leu Thr Asn Ser Lys Gly Gln Asn Cys Gly Tyr Arg Arg 1875 1880 1885	7465
tgc cgc gcg agc ggt gta ctg acg acc agc tgc ggt aat acc ctc aca Cys Arg Ala Ser Gly Val Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr 1890 1895 1900	7513
tgt tac ttg aag gcc gct gcg gcc tgt cga gct gcg aag ctc cag gac Cys Tyr Leu Lys Ala Ala Ala Cys Arg Ala Ala Lys Leu Gln Asp 1905 1910 1915 1920	7561
tgc acg atg ctc gta tgc gga gac gac ctt gtc gtt atc tgt gaa agc Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser 1925 1930 1935	7609
gcg ggg acc caa gag gac gag gcg agc cta cgg gcc ttc acg gag gct Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala 1940 1945 1950	7657
atg act aga tac tct gcc ccc cct ggg gac ccg ccc aaa cca gaa tac Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr 1955 1960 1965	7705
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gcg cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 1975 1980	7753
gat gca tct ggc aaa agg gtg tac tat ctc acc cgt gac ccc acc acc Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr 1985 1990 1995 2000	7801

ccc ctt gcg cggttgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 2010 2015	7849
tcc tgg cta ggc aac atc atc atg tat gcg ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
atg atc ctg atg act cat ttc ttc tcc atc ctt cta gct cag gaa caa Met Ile Leu Met Thr His Phe Phe Ser Ile Leu Leu Ala Gln Glu Gln 2035 2040 2045	7945
cctt gaa aaa gcc cta gat tgt cag atc tac ggg gcc tgt tac tcc att Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile 2050 2055 2060	7993
gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
gca ttt tca ctc cat agt tac tct cca ggt gag atc aat agg gtg gct Ala Phe Ser Leu His Ser Tyr Ser Pro Gly Glu Ile Asn Arg Val Ala 2085 2090 2095	8089
tca tgc ctc agg aaa ctt ggg gta ccg ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cggttgc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233
aaa ctc act cca atc ccg gct gcg tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160	8281
ttc gtt gct ggt tac agc ggg gga gac ata tat cac agc ctg tct cgt Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg 2165 2170 2175	8329
gcc cga ccc cgc tgg ttc atg tgg tgc cta ctc cta ctt tct gta ggg Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly 2180 2185 2190	8377
gtatggc atc tat cta ctc ccc aac cga tga acggggagct aaacactccaa Val Gly Ile Tyr Leu Leu Pro Asn Arg * 2195 2200	8427
ggccaaatagg ccatcctgtt tttttttttt tttttttttt tttttttttt tttttttttt 8487 ttttttttttt tttttttttt tttttttttt tttttttttt tttttttttt tttttttttt 8547 ccatcttagc cctagtcacg gctagctgtg aaaggtccgt gagccgcttg actgcagaga 8607 tgctgatac tggcctctct gcagatcaag t 8638	

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ccccctccc gggagagcca tagtggtctg cggAACCGT gagtacaccg gaattgccag 180  
gacgaccggg tcctttcttgc gatcaacccg ctcaatgcct ggagatttgg gcgtgcccc 240  
gcgagactgc tagccgagta gtgttgggtc gcgaaaggcc ttgtggtaact gcctgatagg 300  
gtgcttgcga gtgccccggg aggtctcgta gaccgtgcac catgagcacg aatcctaaac 360  
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cgcccgcttgc ggtggagagg ctattcgct atgactggc acaacagaca atcggtctgc 480  
ctgatgccgc cgtgttccgg ctgtcagcgc agggccccc ggttctttt gtcaagaccg 540  
acctgtccgg tgccctgaat gaactgcagg acgaggcgc gcccgtatcg tggctggcca 600  
cgacggcgt tccttgcga gctgtgtcg acgttgcac tgaagcggga agggactggc 660  
tgctattggg cgaagtgcgc gggcaggatc tcctgtcatc tcaccttgc cctgcccaga 720  
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c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt 1849

Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly

1

5

10

15

ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg 1897  
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg  
20 25 30

ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg 1945  
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu  
35 40 45

caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc 1993  
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val  
50 55 60

atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc 2041

Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr	65	70	75	80
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt				2089
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly	85	90	95	
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca				2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala	100	105	110	
tgc atg ctg gtg cgaa gtt gct ggg ggt cat tat gtc caa atg gct				2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala	115	120	125	
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc				2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu	130	135	140	
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg				2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val	145	150	155	
gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc				2329
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr	165	170	175	
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc				2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro	180	185	190	
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc				2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser	195	200	205	
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc				2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser	210	215	220	
caa cag acg cga ggc cta ctt ggc tgc atc atc acc agc ctc aca ggc				2521
Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly	225	230	235	
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca				2569
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala	245	250	255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc				2617
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val	260	265	270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc				2665
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile	275	280	285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg				2713
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala				

290

295

300

ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	305	310	315	320	2761
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp					
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cg	325	330	335		2809
Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg					
ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg	340	345	350		2857
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu					
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	355	360	365		2905
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val					
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg	370	375	380		2953
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val					
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc	385	390	395	400	3001
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val					
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	405	410	415		3049
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val					
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	420	425	430		3097
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro					
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	435	440	445		3145
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser					
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	450	455	460		3193
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly					
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc	465	470	475	480	3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala					
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc	485	490	495		3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys					
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act	500	505	510		3337
Ser Gly Gly Ala Tyr Asp Ile Ile Ile Cys Asp Glu Cys His Ser Thr					
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag	515	520	525		3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu					

acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga		3433	
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly			
530	535	540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc		3481	
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser			
545	550	555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc		3529	
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile			
565	570	575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat		3577	
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat		3625	
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
595	600	605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att		3673	
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
610	615	620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac		3721	
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc		3769	
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser			
645	650	655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg		3817	
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala			
660	665	670	
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc		3865	
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
675	680	685	
att tac agg ttt gtg act cca gga gaa cgg ccc tgc ggc atg ttc gat		3913	
Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp			
690	695	700	
tcc tcg gtt ctg tgc gag tgc tat gac gcg ggc tgt gct tgg tac gag		3961	
Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu			
705	710	715	720
ctc acg ccc gcc gag acc tca gtt agg ttg cgg gct tac cta aac aca		4009	
Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr			
725	730	735	
cca ggg ttg ccc gtc tgc cag gac cat ctg gag ttc tgg gag ggc gtc		4057	
Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val			
740	745	750	

ttt aca ggc ctc acc cac ata gac gcc cat ttc ttg tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765	4105
cag gca gga gac aac ttc ccc tac ctg gta gca tac cag gct acg gtg Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780	4153
tgc gcc agg gct cag gct cca cct cca tcg tgg gac caa atg tgg aag Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800	4201
tgt ctc ata cgg cta aag cct acg ctg cac ggg cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815	4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820 825 830	4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845	4345
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aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys 930 935 940	4633
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agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro 965 970 975	4729
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc	4777

Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu			
980	985	990	
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc			4825
Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala			
995	1000	1005	
gcc caa ctt gct cct ccc agc gct gct tcc gct ttc gta ggc gcc ggc			4873
Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly			
1010	1015	1020	
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg			4921
Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val			
1025	1030	1035	1040
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc			4969
Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala			
1045	1050	1055	
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac			5017
Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn			
1060	1065	1070	
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg			5065
Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val			
1075	1080	1085	
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg			5113
Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val			
1090	1095	1100	
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc			5161
Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val			
1105	1110	1115	1120
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act			5209
Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr			
1125	1130	1135	
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac			5257
Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His			
1140	1145	1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta			5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu			
1155	1160	1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc			5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala			
1170	1175	1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc			5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe			
1185	1190	1195	1200
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg			5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met			

1205	1210	1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220	1225	1230	5497
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gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser 1250	1255	1260	5593
ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265	1270	1275	5641
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285	1290	1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300	1305	1310	5737
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tac ccg gtt ggg tca cag ctc cca tgc qag ccc gaa ctg gac gta gca Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala 1345	1350	1355	5881
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr 1365	1370	1375	5929
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380	1385	1390	5977
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395	1400	1405	6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410	1415	1420	6073
cg <sup>g</sup> cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425	1430	1435	6121
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Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu		
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Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe		
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Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu		
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tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg		6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly		
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Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg		
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Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala		
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Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp		
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Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile	
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Cys Thr Met Leu Val Cys Gly Asp Asp Leu Val Val Ile Cys Glu Ser			
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Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr			
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Asp Ala Ser Gly Lys Arg Val Tyr Tyr Leu Thr Arg Asp Pro Thr Thr			
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Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn			
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Leu Glu Lys Ala Leu Asp Cys Gln Ile Tyr Gly Ala Cys Tyr Ser Ile			
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Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His			
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Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu			
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Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp			
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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg			
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Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly			
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act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc		3529	

Thr	Gly	Glu	Ile	Pro	Phe	Tyr	Gly	Lys	Ala	Ile	Pro	Ile	Glu	Thr	Ile	
565																575
aag	ggg	ggg	agg	cac	ctc	att	ttc	tgc	cat	tcc	aag	aag	aaa	tgt	gat	3577
Lys	Gly	Gly	Arg	His	Leu	Ile	Phe	Cys	His	Ser	Lys	Lys	Lys	Cys	Asp	
580																590
gag	ctc	gcc	gcf	aag	ctg	tcc	ggc	ctc	gga	ctc	aat	gct	gta	gca	tat	3625
Glu	Leu	Ala	Ala	Lys	Leu	Ser	Gly	Leu	Gly	Leu	Asn	Ala	Val	Ala	Tyr	
595																605
tac	cgg	ggc	ctt	gat	gta	tcc	gtc	ata	cca	act	agc	gga	gac	gtc	att	3673
Tyr	Arg	Gly	Leu	Asp	Val	Ser	Val	Ile	Pro	Thr	Ser	Gly	Asp	Val	Ile	
610																620
gtc	gta	gca	acg	gac	gct	cta	atg	acg	ggc	ttt	acc	ggc	gat	ttc	gac	3721
Val	Val	Ala	Thr	Asp	Ala	Leu	Met	Thr	Gly	Phe	Thr	Gly	Asp	Phe	Asp	
625																640
tca	gtg	atc	gac	tgc	aat	aca	tgt	gtc	acc	cag	aca	gtc	gac	ttc	acg	3769
Ser	Val	Ile	Asp	Cys	Asn	Thr	Cys	Val	Thr	Gln	Thr	Val	Asp	Phe	Ser	
645																655
ctg	gac	ccg	acc	ttc	acc	att	gag	acg	acg	acc	gtg	cca	caa	gac	gcf	3817
Leu	Asp	Pro	Thr	Phe	Thr	Ile	Glu	Thr	Thr	Val	Pro	Gln	Asp	Ala		
660																670
gtg	tca	cgc	tcg	cag	cgf	cga	ggc	agg	act	ggt	agg	ggc	agg	atg	ggc	3865
Val	Ser	Arg	Ser	Gln	Arg	Arg	Gly	Arg	Thr	Gly	Arg	Gly	Arg	Met	Gly	
675																685
att	tac	agg	ttt	gtg	act	cca	gga	gaa	cgf	ccc	tcg	ggc	atg	ttc	gat	3913
Ile	Tyr	Arg	Phe	Val	Thr	Pro	Gly	Glu	Arg	Pro	Ser	Gly	Met	Phe	Asp	
690																695
tcc	tcg	gtt	ctg	tgc	gag	tgc	tat	gac	gcf	ggc	tgt	gct	tgg	tac	gag	3961
Ser	Ser	Val	Leu	Cys	Glu	Cys	Tyr	Asp	Ala	Gly	Cys	Ala	Trp	Tyr	Glu	
705																710
715																720
ctc	acg	ccc	gcc	gag	acc	tca	gtt	agg	ttg	cgf	gct	tac	cta	aac	aca	4009
Leu	Thr	Pro	Ala	Glu	Thr	Ser	Val	Arg	Leu	Arg	Ala	Tyr	Leu	Asn	Thr	
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735																735
cca	ggg	ttg	ccc	gtc	tgc	cag	gac	cat	ctg	gag	ttc	tgg	gag	agc	gtc	4057
Pro	Gly	Leu	Pro	Val	Cys	Gln	Asp	His	Leu	Glu	Phe	Trp	Glu	Ser	Val	
740																745
750																750
ttt	aca	ggc	ctc	acc	cac	ata	gac	gcc	cat	ttc	ttg	tcc	cag	act	aag	4105
Phe	Thr	Gly	Leu	Thr	His	Ile	Asp	Ala	His	Phe	Leu	Ser	Gln	Thr	Lys	
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765																765
cag	gca	gga	gac	aac	ttc	ccc	tac	ctg	gta	gca	tac	cag	gct	acg	gtg	4153
Gln	Ala	Gly	Asp	Asn	Phe	Pro	Tyr	Leu	Val	Ala	Tyr	Gln	Ala	Thr	Val	
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780																780
tgc	gcc	agg	gct	cag	gct	cct	cca	tcg	tgg	gac	caa	atg	tgg	aag	4201	
Cys	Ala	Arg	Ala	Gln	Ala	Pro	Pro	Pro	Ser	Trp	Asp	Gln	Met	Trp	Lys	

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tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820		825		830
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag gtc gtc acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835		840		845
agc acc tgg gtg ctg gta ggc gga gtc cta gca gct ctg gcc gcg tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850		855		860
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc ttg tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865		870		880
gga aag ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag ttc Gly Lys Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe 885		890		895
gat gag atg gaa gag tgc gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900		905		910
atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln 915		920		925
aca gcc acc aag caa gcg gag gct gct gct ccc gtg gtg gaa tcc aag Thr Ala Thr Lys Gln Ala Glu Ala Ala Ala Pro Val Val Glu Ser Lys 930		935		940
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile 945		950		960
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro 965		970		975
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu 980		985		990
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala 995		1000		1005
gcc caa ctt gct cct ccc agc gct gct tct gct ttc gta ggc gcc ggc Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly 1010		1015		1020

atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Val 1025 1030 1035 1040	4921
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc Asp Ile Leu Ala Gly Tyr Gly Ala Val Ala Gly Ala Leu Val Ala 1045 1050 1055	4969
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn 1060 1065 1070	5017
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val 1075 1080 1085	5065
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val 1090 1095 1100	5113
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His 1140 1145 1150	5257
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu 1155 1160 1165	5305
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tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe 1185 1190 1195 1200	5401
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caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn 1220 1225 1230	5497
ggt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat Gly Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His 1235 1240 1245	5545

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ccg gcg cca aat tat tct agg gcg ctg tgg cgg gtg gct gct gag gag Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu 1265 1270 1275 1280	5641
tac gtg gag gtt acg cgg gtg ggg gat ttc cac tac gtg acg ggc atg Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met 1285 1290 1295	5689
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe 1300 1305 1310	5737
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cg <sup>g</sup> cag gag atg ggc ggg aac atc acc cgc gtg gag tca gaa aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425 1430 1435 1440	6121
gta gta att ttg gac tct ttc gag ccg ctc caa gcg gag gag gat gag Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu 1445 1450 1455	6169
agg gaa gta tcc gtt ccg gcg gag atc ctg cgg agg tcc agg aaa ttc Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe 1460 1465 1470	6217
cct cga gcg atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg	6265

Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu			
1475	1480	1485	
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg			6313
Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly			
1490	1495	1500	
tgt cca ttg ccg cct gcc aag gcc cct ccg ata cca cct cca cgg agg			6361
Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg			
1505	1510	1515	1520
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gcg			6409
Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala			
1525	1530	1535	
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac			6457
Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp			
1540	1545	1550	
agc ggc acg gca acg gcc tct cct gac cag ccc tcc gac gac ggc gac			6505
Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp			
1555	1560	1565	
gcg gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag ggg			6553
Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly			
1570	1575	1580	
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Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser			
1585	1590	1595	1600
gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg			6649
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp			
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aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc			6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro			
1620	1625	1630	
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat			6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr			
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gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt			6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe			
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gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag			6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu			
1665	1670	1675	1680
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag			6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu			
1685	1690	1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc			6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly			

1700	1705	1710	
tat ggg gca aag gac gtc cg	aac cta tcc agc aag gcc	gtt aac cac	6985
Tyr Gly Ala Lys Asp Val Arg	Asn Leu Ser Ser Lys Ala Val Asn His		
1715	1720	1725	
atc cgc tcc gtg tgg aag gac	ttg ctg gaa gac act gag aca cca att		7033
Ile Arg Ser Val Trp Lys Asp	Leu Leu Glu Asp Thr Glu Thr Pro Ile		
1730	1735	1740	
gac acc acc atc atg gca aaa aat	gag gtt ttc tgc gtc caa cca gag		7081
Asp Thr Thr Ile Met Ala Lys Asn	Glu Val Phe Cys Val Gln Pro Glu		
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aag ggg ggc cgc aag cca gct	cgc ctt atc gta ttc cca gat ttg ggg		7129
Lys Gly Gly Arg Lys Pro Ala Arg	Leu Ile Val Phe Pro Asp Leu Gly		
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gtt cgt gtg tgc gag aaa atg	gcc ctt tac gat gtg gtc tcc acc ctc		7177
Val Arg Val Cys Glu Lys Met	Ala Leu Tyr Asp Val Val Ser Thr Leu		
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cct cag gcc gtg atg ggc tct	tca tac gga ttc caa tac tct cct gga		7225
Pro Gln Ala Val Met Gly Ser	Tyr Gly Phe Gln Tyr Ser Pro Gly		
1795	1800	1805	
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Gln Arg Val Glu Phe Leu Val	Asn Ala Trp Lys Ala Lys Lys Cys Pro		
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atg ggc ttc gca tat gac acc	cgc tgt ttt gac tca acg gtc act gag		7321
Met Gly Phe Ala Tyr Asp Thr	Arg Cys Phe Asp Ser Thr Val Thr Glu		
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aat gac atc cgt gtt gag	gag tca atc tac caa tgt tgt gac ttg gcc		7369
Asn Asp Ile Arg Val Glu Glu	Ser Ile Tyr Gln Cys Cys Asp Leu Ala		
1845	1850	1855	
ccc gaa gcc aga cag gcc	ata agg tcg ctc aca gag cgg ctt tac atc		7417
Pro Glu Ala Arg Gln Ala	Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile		
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ggg ggc ccc ctg act aat	tct aaa ggg cag aac tgc ggc tat cgc cgg		7465
Gly Gly Pro Leu Thr Asn Ser	Lys Gly Gln Asn Cys Gly Tyr Arg Arg		
1875	1880	1885	
tgc cgc gcg agc ggt gta	ctg acg acc agc tgc ggt aat acc ctc aca		7513
Cys Arg Ala Ser Gly Val	Leu Thr Thr Ser Cys Gly Asn Thr Leu Thr		
1890	1895	1900	
tgt tac ttg aag gcc gct	gct gcc tgt cga gct gcg aag ctc cag		7561
Cys Tyr Leu Lys Ala Ala	Ala Cys Arg Ala Ala Lys Leu Gln Asp		
1905	1910	1915	1920
tgc acg atg ctc gta tgc	gga gac gac ctt gtc gtt atc tgt gaa agc		7609
Cys Thr Met Leu Val Cys	Gly Asp Asp Leu Val Val Ile Cys Glu Ser		
1925	1930	1935	

gcg ggg acc caa gag gac gag gcg agc cta cg <sup>g</sup> gcc ttc acg gag gct Ala Gly Thr Gln Glu Asp Glu Ala Ser Leu Arg Ala Phe Thr Glu Ala 1940 1945 1950	7657
atg act aga tac tct gcc ccc cct ggg gac cc <sup>g</sup> ccc aaa cca gaa tac Met Thr Arg Tyr Ser Ala Pro Pro Gly Asp Pro Pro Lys Pro Glu Tyr 1955 1960 1965	7705
gac ttg gag ttg ata aca tca tgc tcc tcc aat gtg tca gtc gc <sup>g</sup> cac Asp Leu Glu Leu Ile Thr Ser Cys Ser Ser Asn Val Ser Val Ala His 1970 1975 1980	7753
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ccc ctt gc <sup>g</sup> cgg gct gc <sup>g</sup> tgg gag aca gct aga cac act cca gtc aat Pro Leu Ala Arg Ala Ala Trp Glu Thr Ala Arg His Thr Pro Val Asn 2005 2010 2015	7849
tcc tgg cta ggc aac atc atc atg tat gc <sup>g</sup> ccc acc ttg tgg gca agg Ser Trp Leu Gly Asn Ile Ile Met Tyr Ala Pro Thr Leu Trp Ala Arg 2020 2025 2030	7897
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gag cca ctt gac cta cct cag atc att caa cga ctc cac ggc ctt agc Glu Pro Leu Asp Leu Pro Gln Ile Ile Gln Arg Leu His Gly Leu Ser 2065 2070 2075 2080	8041
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tca tgc ctc agg aaa ctt ggg gta cc <sup>g</sup> ccc ttg cga gtc tgg aga cat Ser Cys Leu Arg Lys Leu Gly Val Pro Pro Leu Arg Val Trp Arg His 2100 2105 2110	8137
cg <sup>g</sup> gcc aga agt gtc cgc gct agg cta ctg tcc cag ggg ggg agg gct Arg Ala Arg Ser Val Arg Ala Arg Leu Leu Ser Gln Gly Gly Arg Ala 2115 2120 2125	8185
gcc act tgt ggc aag tac ctc ttc aac tgg gca gta agg acc aag ctc Ala Thr Cys Gly Lys Tyr Leu Phe Asn Trp Ala Val Arg Thr Lys Leu 2130 2135 2140	8233
aaa ctc act cca atc cc <sup>g</sup> gct gc <sup>g</sup> tcc cag ttg gat tta tcc agc tgg Lys Leu Thr Pro Ile Pro Ala Ala Ser Gln Leu Asp Leu Ser Ser Trp 2145 2150 2155 2160	8281

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Phe Val Ala Gly Tyr Ser Gly Gly Asp Ile Tyr His Ser Leu Ser Arg  
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Ala Arg Pro Arg Trp Phe Met Trp Cys Leu Leu Leu Ser Val Gly  
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gcccgtttt ggcaatgtga gggccggaa acctggccct gctttcttgc cgagcattcc 1380  
taggggtctt tcccctctcg ccaaaggaaat gcaaggctcg ttgaatgtcg tgaaggaagc 1440  
agttcctctg gaagcttctt gaagacaaac aacgtctgtt gcccgttgc gcaaggcagcg 1500  
gaaccccccga cctggcgaca ggtgcctctg cggccaaaag ccacgtgtat aagatacacc 1560  
tgcaaaggcg gcacaacccc agtgcacgt tgtgagttgg atagttgtgg aaagagtcaa 1620  
atggctctcc tcaagcgtat tcaacaaggg gctgaaggat gcccagaagg tacccttac 1680  
tatggatct gatctggggc ctgggtgcac atgcttatac tttgttttagt cgaggttaaa 1740  
aaacgtcttag gccccccgaa ccacggggac gtgggttcc tttgaaaaac acgataatac 1800

c atg gac cgg gag atg gca gca tcg tgc gga ggc gcg gtt ttc gta ggt	1849
Met Asp Arg Glu Met Ala Ala Ser Cys Gly Gly Ala Val Phe Val Gly	
1 5 10 15	
ctg ata ctc ttg acc ttg tca ccg cac tat aag ctg ttc ctc gct agg	1897
Leu Ile Leu Leu Thr Leu Ser Pro His Tyr Lys Leu Phe Leu Ala Arg	
20 25 30	
ctc ata tgg tgg tta caa tat ttt atc acc agg gcc gag gca cac ttg	1945
Leu Ile Trp Trp Leu Gln Tyr Phe Ile Thr Arg Ala Glu Ala His Leu	
35 40 45	
caa gtg tgg atc ccc ccc ctc aac gtt cgg ggg ggc cgc gat gcc gtc	1993
Gln Val Trp Ile Pro Pro Leu Asn Val Arg Gly Gly Arg Asp Ala Val	
50 55 60	
atc ctc ctc acg tgc gcg atc cac cca gag cta atc ttt acc atc acc	2041
Ile Leu Leu Thr Cys Ala Ile His Pro Glu Leu Ile Phe Thr Ile Thr	
65 70 75 80	
aaa atc ttg ctc gcc ata ctc ggt cca ctc atg gtg ctc cag gct ggt	2089
Lys Ile Leu Leu Ala Ile Leu Gly Pro Leu Met Val Leu Gln Ala Gly	
85 90 95	
ata acc aaa gtg ccg tac ttc gtg cgc gca cac ggg ctc att cgt gca	2137
Ile Thr Lys Val Pro Tyr Phe Val Arg Ala His Gly Leu Ile Arg Ala	
100 105 110	
tgc atg ctg gtg cgg aag gtt gct ggg ggt cat tat gtc caa atg gct	2185
Cys Met Leu Val Arg Lys Val Ala Gly Gly His Tyr Val Gln Met Ala	
115 120 125	
ctc atg aag ttg gcc gca ctg aca ggt acg tac gtt tat gac cat ctc	2233
Leu Met Lys Leu Ala Ala Leu Thr Gly Thr Tyr Val Tyr Asp His Leu	
130 135 140	
acc cca ctg cgg gac tgg gcc cac gcg ggc cta cga gac ctt gcg gtg	2281
Thr Pro Leu Arg Asp Trp Ala His Ala Gly Leu Arg Asp Leu Ala Val	
145 150 155 160	
gca gtt gag ccc gtc gtc ttc tct gat atg gag acc aag gtt atc acc	2329
Ala Val Glu Pro Val Val Phe Ser Asp Met Glu Thr Lys Val Ile Thr	
165 170 175	
tgg ggg gca gac acc gcg gcg tgt ggg gac atc atc ttg ggc ctg ccc	2377
Trp Gly Ala Asp Thr Ala Ala Cys Gly Asp Ile Ile Leu Gly Leu Pro	
180 185 190	
gtc tcc gcc cgc agg ggg agg gag ata cat ctg gga ccg gca gac agc	2425
Val Ser Ala Arg Arg Gly Arg Glu Ile His Leu Gly Pro Ala Asp Ser	
195 200 205	
ctt gaa ggg cag ggg tgg cga ctc ctc gcg cct att acg gcc tac tcc	2473
Leu Glu Gly Gln Gly Trp Arg Leu Leu Ala Pro Ile Thr Ala Tyr Ser	
210 215 220	
caa cag acg cga ggc cta ctt ggc tgc atc atc acc agc ctc aca ggc	2521

Gln Gln Thr Arg Gly Leu Leu Gly Cys Ile Ile Thr Ser Leu Thr Gly			
225	230	235	240
cgg gac agg aac cag gtc gag ggg gag gtc caa gtg gtc tcc acc gca	2569		
Arg Asp Arg Asn Gln Val Glu Gly Glu Val Gln Val Val Ser Thr Ala			
245	250	255	
aca caa tct ttc ctg gcg acc tgc gtc aat ggc gtg tgt tgg act gtc	2617		
Thr Gln Ser Phe Leu Ala Thr Cys Val Asn Gly Val Cys Trp Thr Val			
260	265	270	
tat cat ggt gcc ggc tca aag acc ctt gcc ggc cca aag ggc cca atc	2665		
Tyr His Gly Ala Gly Ser Lys Thr Leu Ala Gly Pro Lys Gly Pro Ile			
275	280	285	
acc caa atg tac acc aat gtg gac cag gac ctc gtc ggc tgg caa gcg	2713		
Thr Gln Met Tyr Thr Asn Val Asp Gln Asp Leu Val Gly Trp Gln Ala			
290	295	300	
ccc ccc ggg gcg cgt tcc ttg aca cca tgc acc tgc ggc agc tcg gac	2761		
Pro Pro Gly Ala Arg Ser Leu Thr Pro Cys Thr Cys Gly Ser Ser Asp			
305	310	315	320
ctt tac ttg gtc acg aag cat gcc gat gtc att ccg gtg cgc cgg cgg	2809		
Leu Tyr Leu Val Thr Lys His Ala Asp Val Ile Pro Val Arg Arg Arg			
325	330	335	
ggc gac agc agg ggg agc cta ctc tcc ccc cgg ccc gtc tcc tac ttg	2857		
Gly Asp Ser Arg Gly Ser Leu Leu Ser Pro Arg Pro Val Ser Tyr Leu			
340	345	350	
aag ggc tct tcg ggc ggt cca ctg ctc tgc ccc tcg ggg cac gct gtg	2905		
Lys Gly Ser Ser Gly Gly Pro Leu Leu Cys Pro Ser Gly His Ala Val			
355	360	365	
ggc atc ttt cgg gct gcc gtg tgc acc cga ggg gtt gcg aag gcg gtg	2953		
Gly Ile Phe Arg Ala Ala Val Cys Thr Arg Gly Val Ala Lys Ala Val			
370	375	380	
gac ttt gta ccc gtc gag tct atg gaa acc act atg cgg tcc ccg gtc	3001		
Asp Phe Val Pro Val Glu Ser Met Glu Thr Thr Met Arg Ser Pro Val			
385	390	395	400
ttc acg gac aac tcg tcc cct ccg gcc gta ccg cag aca ttc cag gtg	3049		
Phe Thr Asp Asn Ser Ser Pro Pro Ala Val Pro Gln Thr Phe Gln Val			
405	410	415	
gcc cat cta cac gcc cct act ggt agc ggc aag agc act aag gtg ccg	3097		
Ala His Leu His Ala Pro Thr Gly Ser Gly Lys Ser Thr Lys Val Pro			
420	425	430	
gct gcg tat gca gcc caa ggg tat aag gtg ctt gtc ctg aac ccg tcc	3145		
Ala Ala Tyr Ala Ala Gln Gly Tyr Lys Val Leu Val Leu Asn Pro Ser			
435	440	445	
gtc gcc gcc acc cta ggt ttc ggg gcg tat atg tct aag gca cat ggt	3193		
Val Ala Ala Thr Leu Gly Phe Gly Ala Tyr Met Ser Lys Ala His Gly			

450	455	460	
atc gac cct aac atc aga acc ggg gta agg acc atc acc acg ggt gcc			3241
Ile Asp Pro Asn Ile Arg Thr Gly Val Arg Thr Ile Thr Thr Gly Ala			
465	470	475	480
ccc atc acg tac tcc acc tat ggc aag ttt ctt gcc gac ggt ggt tgc			3289
Pro Ile Thr Tyr Ser Thr Tyr Gly Lys Phe Leu Ala Asp Gly Gly Cys			
485	490	495	
tct ggg ggc gcc tat gac atc ata ata tgt gat gag tgc cac tca act			3337
Ser Gly Gly Ala Tyr Asp Ile Ile Cys Asp Glu Cys His Ser Thr			
500	505	510	
gac tcg acc act atc ctg ggc atc ggc aca gtc ctg gac caa gcg gag			3385
Asp Ser Thr Thr Ile Leu Gly Ile Gly Thr Val Leu Asp Gln Ala Glu			
515	520	525	
acg gct gga gcg cga ctc gtc gtg ctc gcc acc gct acg cct ccg gga			3433
Thr Ala Gly Ala Arg Leu Val Val Leu Ala Thr Ala Thr Pro Pro Gly			
530	535	540	
tcg gtc acc gtg cca cat cca aac atc gag gag gtg gct ctg tcc agc			3481
Ser Val Thr Val Pro His Pro Asn Ile Glu Glu Val Ala Leu Ser Ser			
545	550	555	560
act gga gaa atc ccc ttt tat ggc aaa gcc atc ccc atc gag acc atc			3529
Thr Gly Glu Ile Pro Phe Tyr Gly Lys Ala Ile Pro Ile Glu Thr Ile			
565	570	575	
aag ggg ggg agg cac ctc att ttc tgc cat tcc aag aag aaa tgc gat			3577
Lys Gly Gly Arg His Leu Ile Phe Cys His Ser Lys Lys Lys Cys Asp			
580	585	590	
gag ctc gcc gcg aag ctg tcc ggc ctc gga ctc aat gct gta gca tat			3625
Glu Leu Ala Ala Lys Leu Ser Gly Leu Gly Leu Asn Ala Val Ala Tyr			
595	600	605	
tac cgg ggc ctt gat gta tcc gtc ata cca act agc gga gac gtc att			3673
Tyr Arg Gly Leu Asp Val Ser Val Ile Pro Thr Ser Gly Asp Val Ile			
610	615	620	
gtc gta gca acg gac gct cta atg acg ggc ttt acc ggc gat ttc gac			3721
Val Val Ala Thr Asp Ala Leu Met Thr Gly Phe Thr Gly Asp Phe Asp			
625	630	635	640
tca gtg atc gac tgc aat aca tgt gtc acc cag aca gtc gac ttc agc			3769
Ser Val Ile Asp Cys Asn Thr Cys Val Thr Gln Thr Val Asp Phe Ser			
645	650	655	
ctg gac ccg acc ttc acc att gag acg acg acc gtg cca caa gac gcg			3817
Leu Asp Pro Thr Phe Thr Ile Glu Thr Thr Val Pro Gln Asp Ala			
660	665	670	
gtg tca cgc tcg cag cgg cga ggc agg act ggt agg ggc agg atg ggc			3865
Val Ser Arg Ser Gln Arg Arg Gly Arg Thr Gly Arg Gly Arg Met Gly			
675	680	685	

att tac agg ttt gtg act cca gga gaa cg <sup>g</sup> ccc tcg ggc atg ttc gat Ile Tyr Arg Phe Val Thr Pro Gly Glu Arg Pro Ser Gly Met Phe Asp 690 695 700	3913
tcc tcg gtt ctg tgc gag tgc tat gac g <sup>c</sup> g <sup>g</sup> g <sup>g</sup> t <sup>g</sup> g <sup>c</sup> t <sup>g</sup> t <sup>g</sup> tac gag Ser Ser Val Leu Cys Glu Cys Tyr Asp Ala Gly Cys Ala Trp Tyr Glu 705 710 715 720	3961
ctc acg ccc gcc gag acc tca gtt agg tt <sup>g</sup> c <sup>g</sup> g <sup>c</sup> t <sup>g</sup> tac cta aac aca Leu Thr Pro Ala Glu Thr Ser Val Arg Leu Arg Ala Tyr Leu Asn Thr 725 730 735	4009
cca ggg tt <sup>g</sup> ccc gtc tgc cag gac cat ctg gag tt <sup>g</sup> t <sup>g</sup> g <sup>g</sup> g <sup>g</sup> g <sup>c</sup> g <sup>t</sup> Pro Gly Leu Pro Val Cys Gln Asp His Leu Glu Phe Trp Glu Gly Val 740 745 750	4057
ttt aca ggc ctc acc cac ata gac gcc cat tt <sup>c</sup> tt <sup>g</sup> tcc cag act aag Phe Thr Gly Leu Thr His Ile Asp Ala His Phe Leu Ser Gln Thr Lys 755 760 765	4105
cag gca gga gac aac tt <sup>c</sup> ccc tac ctg gta gca tac cag g <sup>c</sup> t <sup>g</sup> acg g <sup>t</sup> Gln Ala Gly Asp Asn Phe Pro Tyr Leu Val Ala Tyr Gln Ala Thr Val 770 775 780	4153
tgc gcc agg gct cag g <sup>c</sup> c <sup>t</sup> cca tcg t <sup>g</sup> gac caa atg t <sup>g</sup> aag Cys Ala Arg Ala Gln Ala Pro Pro Ser Trp Asp Gln Met Trp Lys 785 790 795 800	4201
tgt ctc ata cgg cta aag cct acg ctg cac g <sup>g</sup> g <sup>g</sup> cca acg ccc ctg ctg Cys Leu Ile Arg Leu Lys Pro Thr Leu His Gly Pro Thr Pro Leu Leu 805 810 815	4249
tat agg ctg gga gcc gtt caa aac gag gtt act acc aca cac ccc ata Tyr Arg Leu Gly Ala Val Gln Asn Glu Val Thr Thr His Pro Ile 820 825 830	4297
acc aaa tac atc atg gca tgc atg tcg gct gac ctg gag g <sup>t</sup> c <sup>g</sup> g <sup>t</sup> acg Thr Lys Tyr Ile Met Ala Cys Met Ser Ala Asp Leu Glu Val Val Thr 835 840 845	4345
agc acc tgg g <sup>t</sup> ctg gta g <sup>g</sup> g <sup>g</sup> g <sup>t</sup> cta gca gct ctg gct g <sup>c</sup> tat Ser Thr Trp Val Leu Val Gly Gly Val Leu Ala Ala Leu Ala Ala Tyr 850 855 860	4393
tgc ctg aca aca ggc agc gtg gtc att gtg ggc agg atc atc tt <sup>g</sup> tcc Cys Leu Thr Thr Gly Ser Val Val Ile Val Gly Arg Ile Ile Leu Ser 865 870 875 880	4441
gga agg ccg gcc atc att ccc gac agg gaa gtc ctt tac cgg gag tt <sup>c</sup> Gly Arg Pro Ala Ile Ile Pro Asp Arg Glu Val Leu Tyr Arg Glu Phe 885 890 895	4489
gat gag atg gaa gag tgt gcc tca cac ctc cct tac atc gaa cag gga Asp Glu Met Glu Glu Cys Ala Ser His Leu Pro Tyr Ile Glu Gln Gly 900 905 910	4537

atg cag ctc gcc gaa caa ttc aaa cag aag gca atc ggg ttg ctg caa Met Gln Leu Ala Glu Gln Phe Lys Gln Lys Ala Ile Gly Leu Leu Gln 915 920 925	4585
aca gcc acc aag caa gcg gag gct gct ccc gtg gtg gaa tcc aag Thr Ala Thr Lys Gln Ala Glu Ala Ala Pro Val Val Glu Ser Lys 930 935 940	4633
tgg cgg acc ctc gaa gcc ttc tgg gcg aag cat atg tgg aat ttc atc Trp Arg Thr Leu Glu Ala Phe Trp Ala Lys His Met Trp Asn Phe Ile 945 950 955 960	4681
agc ggg ata caa tat tta gca ggc ttg tcc act ctg cct ggc aac ccc Ser Gly Ile Gln Tyr Leu Ala Gly Leu Ser Thr Leu Pro Gly Asn Pro 965 970 975	4729
gcg ata gca tca ctg atg gca ttc aca gcc tct atc acc agc ccg ctc Ala Ile Ala Ser Leu Met Ala Phe Thr Ala Ser Ile Thr Ser Pro Leu 980 985 990	4777
acc acc caa cat acc ctc ctg ttt aac atc ctg ggg gga tgg gtg gcc Thr Thr Gln His Thr Leu Leu Phe Asn Ile Leu Gly Gly Trp Val Ala 995 1000 1005	4825
gcc caa ctt gct ccc agc gct tcc gct ttc gta ggc gcc ggc Ala Gln Leu Ala Pro Pro Ser Ala Ala Ser Ala Phe Val Gly Ala Gly 1010 1015 1020	4873
atc gct gga gcg gct gtt ggc agc ata ggc ctt ggg aag gtg ctt gtg Ile Ala Gly Ala Ala Val Gly Ser Ile Gly Leu Gly Lys Val Leu Val 1025 1030 1035 1040	4921
gat att ttg gca ggt tat gga gca ggg gtg gca ggc gcg ctc gtg gcc Asp Ile Leu Ala Gly Tyr Gly Ala Gly Val Ala Gly Ala Leu Val Ala 1045 1050 1055	4969
ttt aag gtc atg agc ggc gag atg ccc tcc acc gag gac ctg gtt aac Phe Lys Val Met Ser Gly Glu Met Pro Ser Thr Glu Asp Leu Val Asn 1060 1065 1070	5017
cta ctc cct gct atc ctc tcc cct ggc gcc cta gtc gtc ggg gtc gtg Leu Leu Pro Ala Ile Leu Ser Pro Gly Ala Leu Val Val Gly Val Val 1075 1080 1085	5065
tgc gca gcg ata ctg cgt cgg cac gtg ggc cca ggg gag ggg gct gtg Cys Ala Ala Ile Leu Arg Arg His Val Gly Pro Gly Glu Gly Ala Val 1090 1095 1100	5113
cag tgg atg aac cgg ctg ata gcg ttc gct tcg cgg ggt aac cac gtc Gln Trp Met Asn Arg Leu Ile Ala Phe Ala Ser Arg Gly Asn His Val 1105 1110 1115 1120	5161
tcc ccc acg cac tat gtg cct gag agc gac gct gca gca cgt gtc act Ser Pro Thr His Tyr Val Pro Glu Ser Asp Ala Ala Ala Arg Val Thr 1125 1130 1135	5209
cag atc ctc tct agt ctt acc atc act cag ctg ctg aag agg ctt cac	5257

Gln Ile Leu Ser Ser Leu Thr Ile Thr Gln Leu Leu Lys Arg Leu His			
1140	1145	1150	
cag tgg atc aac gag gac tgc tcc acg cca tgc tcc ggc tcg tgg cta			5305
Gln Trp Ile Asn Glu Asp Cys Ser Thr Pro Cys Ser Gly Ser Trp Leu			
1155	1160	1165	
aga gat gtt tgg gat tgg ata tgc acg gtg ttg act gat ttc aag gcc			5353
Arg Asp Val Trp Asp Trp Ile Cys Thr Val Leu Thr Asp Phe Lys Ala			
1170	1175	1180	
tgg ctc cag tcc aag ctc ctg ccg cga ttg ccg gga gtc ccc ttc ttc			5401
Trp Leu Gln Ser Lys Leu Leu Pro Arg Leu Pro Gly Val Pro Phe Phe			
1185	1190	1195	1200
tca tgt caa cgt ggg tac aag gga gtc tgg ccg ggc gac ggc atc atg			5449
Ser Cys Gln Arg Gly Tyr Lys Gly Val Trp Arg Gly Asp Gly Ile Met			
1205	1210	1215	
caa acc acc tgc cca tgt gga gca cag atc acc gga cat gtg aaa aac			5497
Gln Thr Thr Cys Pro Cys Gly Ala Gln Ile Thr Gly His Val Lys Asn			
1220	1225	1230	
tgt tcc atg agg atc gtg ggg cct agg acc tgt agt aac acg tgg cat			5545
Cys Ser Met Arg Ile Val Gly Pro Arg Thr Cys Ser Asn Thr Trp His			
1235	1240	1245	
gga aca ttc ccc att aac gcg tac acc acg ggc ccc tgc acg ccc tcc			5593
Gly Thr Phe Pro Ile Asn Ala Tyr Thr Gly Pro Cys Thr Pro Ser			
1250	1255	1260	
ccg gcg cca aat tat tct agg gcg ctg tgg ccg gtg gct gct gag gag			5641
Pro Ala Pro Asn Tyr Ser Arg Ala Leu Trp Arg Val Ala Ala Glu Glu			
1265	1270	1275	1280
tac gtg gag gtt acg cga gtg ggg gat ttc cac tac gtg acg ggc atg			5689
Tyr Val Glu Val Thr Arg Val Gly Asp Phe His Tyr Val Thr Gly Met			
1285	1290	1295	
acc act gac aac gta aag tgc ccg tgt cag gtt ccg gcc ccc gaa ttc			5737
Thr Thr Asp Asn Val Lys Cys Pro Cys Gln Val Pro Ala Pro Glu Phe			
1300	1305	1310	
ttc aca gaa gtg gat ggg gtg ccg ttg cac agg tac gct cca gcg tgc			5785
Phe Thr Glu Val Asp Gly Val Arg Leu His Arg Tyr Ala Pro Ala Cys			
1315	1320	1325	
aaa ccc ctc cta cgg gag gag gtc aca ttc ctg gtc ggg ctc aat caa			5833
Lys Pro Leu Leu Arg Glu Glu Val Thr Phe Leu Val Gly Leu Asn Gln			
1330	1335	1340	
tac ccg gtt ggg tca cag ctc cca tgc gag ccc gaa ctg gac gta gca			5881
Tyr Pro Val Gly Ser Gln Leu Pro Cys Glu Pro Glu Leu Asp Val Ala			
1345	1350	1355	1360
gtg ctc act tcc atg ctc acc gac ccc tcc cac att acg gcg gag acg			5929
Val Leu Thr Ser Met Leu Thr Asp Pro Ser His Ile Thr Ala Glu Thr			

1365	1370	1375	
gct aag cgt agg ctg gcc agg gga tct ccc ccc tcc ttg gcc agc tca Ala Lys Arg Arg Leu Ala Arg Gly Ser Pro Pro Ser Leu Ala Ser Ser 1380	1385	1390	5977
tca gct agc cag ctg tct gcg cct tcc ttg aag gca aca tgc act acc Ser Ala Ser Gln Leu Ser Ala Pro Ser Leu Lys Ala Thr Cys Thr Thr 1395	1400	1405	6025
cgt cat gac tcc ccg gac gct gac ctc atc gag gcc aac ctc ctg tgg Arg His Asp Ser Pro Asp Ala Asp Leu Ile Glu Ala Asn Leu Leu Trp 1410	1415	1420	6073
cg <sup>g</sup> cag gag atg ggc ggg aac atc acc cgc gtg gag tca gag aat aag Arg Gln Glu Met Gly Gly Asn Ile Thr Arg Val Glu Ser Glu Asn Lys 1425	1430	1435	6121
gta gta att ttg gac tct ttc gag ccg ctc caa gc <sup>g</sup> gag gag gat gag Val Val Ile Leu Asp Ser Phe Glu Pro Leu Gln Ala Glu Glu Asp Glu 1445	1450	1455	6169
agg gaa gta tcc gtt ccg gc <sup>g</sup> gag atc ctg cgg agg tcc agg aaa tt <sup>c</sup> Arg Glu Val Ser Val Pro Ala Glu Ile Leu Arg Arg Ser Arg Lys Phe 1460	1465	1470	6217
cct cga gc <sup>g</sup> atg ccc ata tgg gca cgc ccg gat tac aac cct cca ctg Pro Arg Ala Met Pro Ile Trp Ala Arg Pro Asp Tyr Asn Pro Pro Leu 1475	1480	1485	6265
tta gag tcc tgg aag gac ccg gac tac gtc cct cca gtg gta cac ggg Leu Glu Ser Trp Lys Asp Pro Asp Tyr Val Pro Pro Val Val His Gly 1490	1495	1500	6313
tgt cca ttg ccg cct gc <sup>g</sup> aag gc <sup>g</sup> cct ccg ata cca cct cca cgg agg Cys Pro Leu Pro Pro Ala Lys Ala Pro Pro Ile Pro Pro Pro Arg Arg 1505	1510	1515	6361
aag agg acg gtt gtc ctg tca gaa tct acc gtg tct tct gcc ttg gc <sup>g</sup> Lys Arg Thr Val Val Leu Ser Glu Ser Thr Val Ser Ser Ala Leu Ala 1525	1530	1535	6409
gag ctc gcc aca aag acc ttc ggc agc tcc gaa tcg tcg gcc gtc gac Glu Leu Ala Thr Lys Thr Phe Gly Ser Ser Glu Ser Ser Ala Val Asp 1540	1545	1550	6457
agc ggc acg gca acg gc <sup>g</sup> tct cct gac cag ccc tcc gac gac ggc gac Ser Gly Thr Ala Thr Ala Ser Pro Asp Gln Pro Ser Asp Asp Gly Asp 1555	1560	1565	6505
gc <sup>g</sup> gga tcc gac gtt gag tcg tac tcc atg ccc ccc ctt gag ggg Ala Gly Ser Asp Val Glu Ser Tyr Ser Ser Met Pro Pro Leu Glu Gly 1570	1575	1580	6553
gag ccg ggg gat ccc gat ctc agc gac ggg tct tgg tct acc gta agc Glu Pro Gly Asp Pro Asp Leu Ser Asp Gly Ser Trp Ser Thr Val Ser 1585	1590	1595	6601
			1600

gag gag gct agt gag gac gtc gtc tgc tcg atg tcc tac aca tgg	6649
Glu Glu Ala Ser Glu Asp Val Val Cys Cys Ser Met Ser Tyr Thr Trp	
1605 1610 1615	
aca ggc gcc ctg atc acg cca tgc gct gcg gag gaa acc aag ctg ccc	6697
Thr Gly Ala Leu Ile Thr Pro Cys Ala Ala Glu Glu Thr Lys Leu Pro	
1620 1625 1630	
atc aat gca ctg agc aac tct ttg ctc cgt cac cac aac ttg gtc tat	6745
Ile Asn Ala Leu Ser Asn Ser Leu Leu Arg His His Asn Leu Val Tyr	
1635 1640 1645	
gct aca aca tct cgc agc gca agc ctg cgg cag aag aag gtc acc ttt	6793
Ala Thr Thr Ser Arg Ser Ala Ser Leu Arg Gln Lys Lys Val Thr Phe	
1650 1655 1660	
gac aga ctg cag gtc ctg gac gac cac tac cgg gac gtg ctc aag gag	6841
Asp Arg Leu Gln Val Leu Asp Asp His Tyr Arg Asp Val Leu Lys Glu	
1665 1670 1675 1680	
atg aag gcg aag gcg tcc aca gtt aag gct aaa ctt cta tcc gtg gag	6889
Met Lys Ala Lys Ala Ser Thr Val Lys Ala Lys Leu Leu Ser Val Glu	
1685 1690 1695	
gaa gcc tgt aag ctg acg ccc cca cat tcg gcc aga tct aaa ttt ggc	6937
Glu Ala Cys Lys Leu Thr Pro Pro His Ser Ala Arg Ser Lys Phe Gly	
1700 1705 1710	
tat ggg gca aag gac gtc cgg aac cta tcc agc aag gcc gtt aac cac	6985
Tyr Gly Ala Lys Asp Val Arg Asn Leu Ser Ser Lys Ala Val Asn His	
1715 1720 1725	
atc cgc tcc gtg tgg aag gac ttg ctg gaa gac act gag aca cca att	7033
Ile Arg Ser Val Trp Lys Asp Leu Leu Glu Asp Thr Glu Thr Pro Ile	
1730 1735 1740	
gac acc acc atc atg gca aaa aat gag gtt ttc tgc gtc caa cca gag	7081
Asp Thr Thr Ile Met Ala Lys Asn Glu Val Phe Cys Val Gln Pro Glu	
1745 1750 1755 1760	
aag ggg ggc cgc aag cca gct cgc ctt atc gta ttc cca gat ttg ggg	7129
Lys Gly Gly Arg Lys Pro Ala Arg Leu Ile Val Phe Pro Asp Leu Gly	
1765 1770 1775	
gtt cgt gtg tgc gag aaa atg gcc ctt tac gat gtg gtc tcc acc ctc	7177
Val Arg Val Cys Glu Lys Met Ala Leu Tyr Asp Val Val Ser Thr Leu	
1780 1785 1790	
cct cag gcc gtg atg ggc tct tca tac gga ttc caa tac tct cct gga	7225
Pro Gln Ala Val Met Gly Ser Ser Tyr Gly Phe Gln Tyr Ser Pro Gly	
1795 1800 1805	
cag cgg gtc gag ttc ctg gtg aat gcc tgg aaa gcg aag aaa tgc cct	7273
Gln Arg Val Glu Phe Leu Val Asn Ala Trp Lys Ala Lys Lys Cys Pro	
1810 1815 1820	

atg ggc ttc gca tat gac acc cgc tgt ttt gac tca acg gtc act gag Met Gly Phe Ala Tyr Asp Thr Arg Cys Phe Asp Ser Thr Val Thr Glu 1825 1830 1835 1840	7321
aat gac atc cgt gtt gag gag tca atc tac caa tgt tgt gac ttg gcc Asn Asp Ile Arg Val Glu Glu Ser Ile Tyr Gln Cys Cys Asp Leu Ala 1845 1850 1855	7369
ccc gaa gcc aga cag gcc ata agg tcg ctc aca gag cgg ctt tac atc Pro Glu Ala Arg Gln Ala Ile Arg Ser Leu Thr Glu Arg Leu Tyr Ile 1860 1865 1870	7417
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			2085				2090			2095						
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			2100				2105			2110						
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Arg	Ala	Arg	Ser	Val	Arg	Ala	Arg	Leu	Leu	Ser	Gln	Gly	Gly	Arg	Ala	
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Ala	Arg	Pro	Arg	Trp	Phe	Met	Trp	Cys	Leu	Leu	Leu	Ser	Val	Gly		
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Val	Gly	Ile	Tyr	Leu	Leu	Pro	Asn	Arg	*							
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14